BREVIORA

Museum of Comparative Zoology

CAMBRIDGE, MASS. MAY 29, 1958 NUMBER 86

A NEW SICISTINE RODENT FROM THE MIOCENE OF WYOMING

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During the course of a study of the Split Rock local fauna of Middle Miocene age, several isolated teeth, two partial maxillaries, and one fairly complete lower jaw of a new sicistine rodent were discovered. Because of the rather limited occurrence of this group in North America and the paucity of previous records, it is felt that this form should be described before the study of the fauna as a whole can be completed.

For the loan of material described below I am indebted to Drs. P. O. McGrew, Loris Russell and A. E. Wood and to the Chicago Natural History Museum. I would like to acknowledge the helpful assistance and suggestions of Professor A. E. Wood and Professor Bryan Patterson.

The following abbreviations are used throughout:

A.C. — Amherst College
C.N.H.M. — Chicago Natural History Museum
R.O.M. — Royal Ontario Museum of Zoology and Paleontology
U.W. — University of Wyoming

Family ZAPODIDAE
Subfamily SICISTINAE

SCHAUBEUMYS SABRAE,[2] n. sp.

Holotype. U. W. No. 1405, partial left mandible with the incisor, M_1, M_2, and the anterior roots of M_3.

Referred Specimens. Partial maxillaries with P^4-M^1 A.C.

[1] This study was made while the author was Rufus B. Kellogg Fellow from Amherst College.

[2] The specific name is given in honor of my wife.

No. 10490, R.O.M. No. 1950; M^1 A.C. Nos. 10489, 10491, 10493, 10494, 11293, C.N.H.M. Nos. PM 2101, 2102, U.W. No. 1406; I^1 C.N.H.M. Nos. PM 2105, 2106; M_1 A.C. Nos. 10492, 11294; M_2 C.N.H.M. No. PM 2103; M_3 C.N.H.M. No. PM 2104.

Diagnosis. Intermediate in size between *Plesiosminthus? clivosus* (Galbreath, 1953, p. 99) and *Shaubeumys grangeri* (Wood, 1935b, p. 1); no anteroconid on M_1; mesostylid closely applied to metaconid on M_2; mesolophid connected to metaconid on M_2; hypoconulid well-developed on M_1-M_2.

Horizon and Locality. Middle Miocene. Vicinity of *Brachycrus* quarry "Exposure No. 2" (Schultz and Falkenbach, 1940, p. 251), seven miles by road northwest of Muddy Gap filling station, in a draw about ¼ mile south of U.S. Highway 280, Fremont County, Wyoming.

Description. The jaw (Fig. 1 H) is broken through the middle of the alveolus of M_3 and down the outer half of the body so that the incisor is revealed beneath M_2. The ridge marking the lower border of the masseteric scar is thick and prominent and extends forward to below the anterior root of M_1. The mental foramen lies almost immediately below the center of the diastema.

The upper teeth are associated in several cases with fragments of palate, the most complete of which is shown in Figure 1 A. The posterior boundary of the anterior palatine foramen is on a line with the anterior end of P^4. A small part of the zygomatic arch is preserved, arising somewhat anterior to P^4, with the ventral border of the infraorbital foramen preserved. However, only that portion of the foramen which transmits the infraorbital nerve is present so that no estimate of the size of the opening for the masseter can be made.

There are a number of isolated upper incisors (Fig. 1 F, G) which agree so closely with the description given by Schaub (1930, p. 621, Fig. 4) for those of the European sicistine, *Plesiosminthus schaubi* Viret, that they are here referred to the North American form, *Schaubeumys sabrae*. They are prominently grooved with the enamel extending 0.2 to 0.3 mm. over the medial side of the tooth. The pulp cavity is Y-shaped, the median arm of the Y being the longer.

The upper fourth premolars (Fig. 1 A, E) are bud-like in appearance with two small buccal cusps, a deep central pit, and a slight lingual swelling. The upper first molars (Fig. 1 A-E)

are almost square. The paracone and metacone are higher than the other cusps. The anterocone and anterior cingulum are well developed with the latter sloping steeply buccally to join the

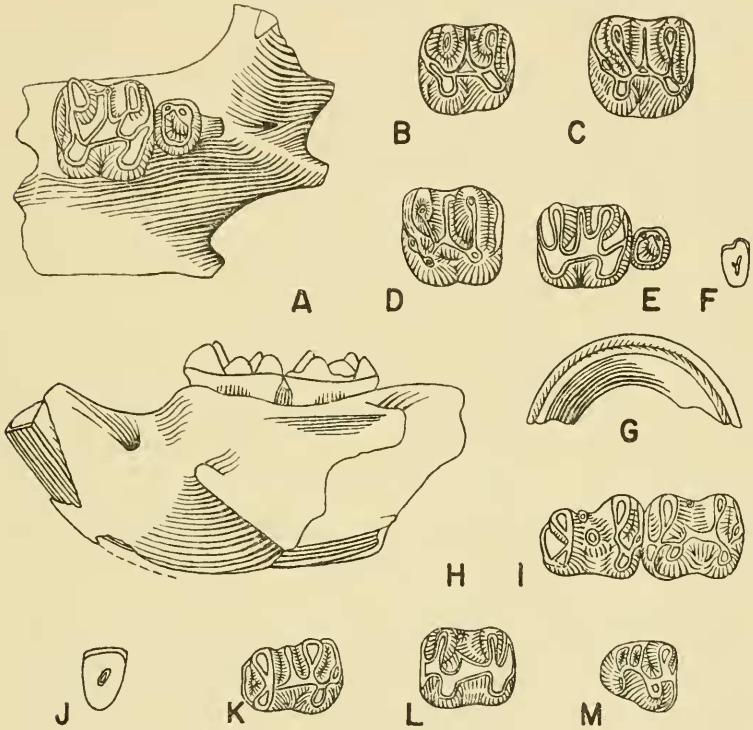

Figure 1. Teeth of *Schaubeumys sabrae*, all X 10 except for *F* and *G* X 5. *A*, R.O.M. No. 1950, part of palate with RP^4-M^1; *B*, A.C. No. 10491, LM^1; *C*, A.C. No. 10489, LM^1; *D*, A.C. No. 10494, LM^1; *E*, A.C. No. 10490, RP^4-M^1; *F*, C.N.H.M. No. PM 2105, I^1, lateral side to right; *G*, the same, lateral view; *H*, U. W. No. 1405, partial left mandible with I_1, M_1, and M_2 (type); *I*, U.W. No. 1405, LM_1-M_2; *J*, U.W. No. 1405, I_1, lateral side to right; *K*, A.C. No. 11294, LM_1; *L*, C.N.H.M. No. PM 2103, LM_2; *M*, C.N.H.M. No. PM 2104, RM_3. Anterior end to the left except for *A*, *E*, *G*, and *M* where it is to the right, and *F* and *J* where it is at the top.

paracone at its base. The paracone and protocone are usually connected through what is probably the protolophule II, either directly, or via the mesocone. In one specimen (Fig. 1 B),

however, there is no trace of the protoloph. The mesoloph extends to the buccal margin of the teeth and is occasionally connected to the paracone, metacone, or both, by low lateral ridges. The posterior cingulum lies below the level of the metaloph.

The lower incisors (Fig. 1 J) are triangular in outline with a flat anterior face and a small elliptical pulp cavity on the wear surface. The enamel extends slightly over the medial side of the tooth.

There is no anteroconid on the first lower molars (Fig. 1 I, K), but on A.C. No. 11293 (Fig. 1 K) there is a small distinct cuspule in the deep basin between the protoconid and the metaconid. This cuspule is not on the anterior cingulum, however, and there is no trace of such a cuspule on either of the other two first lower molars. In all the specimens there is a strong ridge or arm rising steeply from the anterior cingulum to the protoconid while lingually the cingulum abuts against the base of the metaconid with no indication of such a cingular arm. In two instances the mesolophid is well-developed in contrast to the distinct mesostylid and mesoconid of U.W. No. 1405 (Fig. 1 I). The hypoconulid is distinct in all cases and closely connected to the hypoconid. The posterior cingulum descends steeply from the hypoconulid and passes to the lingual edge of the tooth terminating well below the entoconid.

The second lower molars (Fig. 1 I, L) are in general similar to the first molars with the one exception that in the former the mesolophid has shifted anteriorly abutting against the metaconid. The mesostylid is thus distinct, lying half way down the steep metaconid slope. The protoconid and metaconid are connected, probably through the metalophulid II. The mesolophid and metalophulid II enclose a small pit between the protoconid and metaconid.

The third lower molar (Fig. 1 M) is proportionately smaller than any of the first or second molars so far encountered, but since so few specimens are available no dependable ranges for tooth size can be determined. The anteroconid is not distinct, but blends into the two cingulum arms, one of which passes to the lingual margin while the other slopes downwards to the base of the protoconid. The mesolophid passes anteriorly to unite

with the metaconid at its base, forming a deep pit between the metalophid and mesolophid. The mesoconid and entoconid are not distinguishable within the crests. The hypoconid is large and is connected to the entoconid region through the posterior cingulum and the anterior hypoconid arm, the two isolating a posterior pit. There is also a central pit between the mesolophid and hypolophid.

Discussion. *Schaubeumys sabrae* is the third mid-Tertiary species of sicistine to be reported from North America. The species previously described are *Schaubeumys grangeri* (Wood, 1935b) from the Lower Rosebud, and *Plesiosminthus? clivosus* (Galbreath, 1953) from Quarry A in NE Colorado, of Middle Miocene age. I have assigned the present population to the North American genus, *Schaubeumys,* rather than to the European genus, *Plesiosminthus,* because I do not feel that at present there is enough evidence available to warrant considering the North American and European forms congeneric. Galbreath (1953, p. 99) was of the same opinion when, in his discussion of *P.? clivosus,* he stated, "It seems unlikely that this North American zapodid from the middle Miocene is congeneric with the lower Miocene zapodid of western Europe." I also feel that the three North American species are congeneric and that *P.? clivosus* should be referred to *Schaubeumys.*

The North American forms can be distinguished on the basis of size: *S. clivosus* is the smallest; *S. sabrae* is intermediate; and *S. grangeri* is the largest. *S. sabrae* is strikingly different from either of the others in the absence of the anteroconid on M_1 and in the fact that the mesolophid abuts against the metaconid and fails to reach the mesostylid on M_2. *S. clivosus* appears to have no distinct hypoconulid on any of the lower teeth whereas this cusp is relatively large in the other two species.

It is of interest to note that all three species occur in a relatively limited time span, no sicistines yet being known in North America from any deposits earlier than Miocene (I am excluding from the Zapodidae the peculiar *Simimys* from the Sespe Eocene), or later than Middle Miocene. This brings up the problem of where the North American sicistines came from. No definite answer is possible but some guesses may be hazarded.

All the North American species show a great many similarities to contemporaneous forms in Europe, and to forms known from the Oligocene of Europe and Mongolia. In fact, if it were not for the presence of grooved upper incisors, *S. sabrae* might be referred to the Mongolian genus *Parasminthus* described by Bohlin in 1946. *Parasminthus* in turn is equally close to the European *Plesiosminthus* (Bohlin, 1946, pp. 16-17), from which it is separated only on the basis of the non-grooved incisors.

Wood (1935a, pp. 225-226) has pointed out that it is quite possible that the presence or absence of a groove on rodent incisors may be controlled by a single gene. He goes on to state that if this is the case such grooving could be lost and regained within one lineage practically at will. In the case of the sicistines this would mean that the North American forms could be derived from the Mongolian complex and that the European forms could also be so derived, or vice versa. Bohlin (1946, p. 43) points out that the structural differences observed between species of *Parasminthus* are of the same kind as those found between the species of *Plesiosminthus*. This is also true when the North American complex is compared with either *Parasminthus* or *Plesiosminthus*. These complexes show the presence of the anteroconid in some species and its absence in others. The degree of development of the mesolophid and the position of the mesostylid vary in a similar manner in each group. The way in which the lophs are formed also shows the same variation, and, finally, the same size ranges occur in each group. This great morphological similarity would seem to indicate that these three complexes are basically similar genetically. (No attempt has been made here to determine generic limits within the Miocene sicistines.)

TABLE OF MEASUREMENTS [1]

	Number of Specimens	Mean	σ	C.V.
I^1				
anteroposterior	8	1.20	.10	8.3
transverse	8	.74	.05	6.8
P^4				
anteroposterior	2	.55		
transverse	2	.65		

[1] All measurements in mm. σ = Standard Deviation, C.V. = Coefficient of Variation.

M^1				
anteroposterior	10	1.32	.08	6.0
transverse	10	1.29	.10	7.8
I_1				
anteroposterior	1	.85		
transverse	1	.60		
M_1				
anteroposterior	3	1.32		
transverse	3	1.02		
M_2				
anteroposterior	2	1.28		
transverse	2	1.11		
M_3				
anteroposterior	1	1.03		
transverse	1	.91		

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